Name: Date:

Polynomial Factoring solution (version 646)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 12x + 44 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-12) \pm \sqrt{(-12)^2 - 4(1)(44)}}{2(1)}$$

$$x = \frac{-(-12) \pm \sqrt{144 - 176}}{2(1)}$$

$$x = \frac{12 \pm \sqrt{-32}}{2}$$

$$x = \frac{12 \pm \sqrt{-16 \cdot 2}}{2}$$

$$x = \frac{12 \pm 4\sqrt{2}\, i}{2}$$

$$x = 6 \pm 2\sqrt{2}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $2 - 9i$ and $-5 - 4i$ in standard form $(a + bi)$.**

Solution

$$(2 - 9i) \cdot (-5 - 4i)$$

$$-10 - 8i + 45i + 36i^2$$

$$-10 - 8i + 45i - 36$$

$$-10 - 36 - 8i + 45i$$

$$-46 + 37i$$

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3. **Write function $f(x) = x^3 - 8x^2 - 3x + 90$ in factored form. I'll give you a hint: one factor is $(x - 6)$.**

Solution

	1	-8	-3	90
6		6	-12	-90
	1	-2	-15	0

$$f(x) = (x - 6)(x^2 - 2x - 15)$$

$$f(x) = (x - 6)(x - 5)(x + 3)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x + 3) \cdot (x - 1)^2 \cdot (x - 5)^2$$

Sketch a graph of polynomial $y = p(x)$.